Pipe Spring National Monument

A Kid's Day at Pipe Spring Field Trip Description

Theme
The various lifeways and subsistence strategies utilized at Pipe Spring by different cultures offer diverse opportunities to experience and reflect upon the difficulties of survival and adaptation in an arid setting, decisions about where and how we live, reasons for westward expansion, and the impacts it has had on the local environment.

Utah State/Arizona Integrated Core Curriculum:
Utah **3rd Grade** Social Studies **Standard 1** (Objectives 1, 2, 3), **Standard 2** (Objectives 1, 2)
Utah **3rd Grade** Science **Standards 3, 4**
Utah **4th Grade** Social Studies **Standard 1** (Objectives 2, 3), **Standard 2** (Objectives 1, 2, 3)
Utah **5th Grade** Social Studies **Standard 4** (Objectives 1, 4)
Arizona **3rd Grade** Social Studies **Strand 1** (Concept 1, 7), **Strand 4** (Concepts 1, 2, 4), **Strand 5** (Concept 1)
Arizona **3rd Grade** Science **Strand 3** (Concept 1)
Arizona **4th Grade** Social Studies **Strand 1** (Concepts 1, 2, 5, 7), **Strand 4** (Concepts 1, 3, 4, 5, 6),
Arizona **4th Grade** Science **Strand 3** (Concept 1), **Strand 6** (Concept 2)
Arizona **5th Grade** Social Studies **Strand 1** (Concept 1, 3, 5), **Strand 4** (Concept 4)

Field Trip Location
Pipe Spring National Monument

Times
All lesson stations are around 15 to 30 minutes.
Recommend selecting three to five stations for field trip.

Background

Students participating in this program will partake in a variety of activities that explore the complicated history of Euro-American and Southern Paiute interactions, the natural resources of the area, and the impacts human use has had on the environment at Pipe Spring. These activities highlight the day-to-day lives and concerns of 1870s period characters, whose identities represent very different perspectives, goals, and interests of the real people who were interacting together over the site's natural resources. The five characters that cover the Pipe Spring experience are the dairy maid, the ranch hand, the Paiute gatherer, the settler, and the telegrapher.

Pipe Spring lies the high desert Arizona Strip, but geological processes bring water in select places when precipitation is stored in permeable sandstone aquifers until finally hitting impermeable layers that force water to the surface at Pipe Spring. This water has drawn humans to the location for over millennia, in successive waves. Some of the earliest inhabitants were ancestral Puebloans that initially hunted with bow and arrows, while gathering edible plants. Over time, they established permanent settlements and developed agriculture. Around 1250 their presence in the area was diminished possibly due to prolonged drought.

Bands of Kaibab Paiutes eventually moved into the area, adapting to their environment with migratory moves seasonally to hunt and take advantage of the natural harvests, while also cultivating staple crops like corn and beans. In time, American westward movement made it to the area, preceded by European diseases. Mormon settlers escaping religious persecution and seeking economic opportunities soon discovered the spring and looked to use the land and spring for ranching and cultivation to contribute to the self-sufficiency of Utah's Mormon

settlements. The Mormon occupation of the spring and building of Winsor Castle over it, among other factors, greatly contributed to the diminishing fortunes of the Kaibab Paiute in the area. Many soon turned to the Mormons for survival out of desperation, but at the cost of identity and agency. Ranching and cultivation practices also had ecological effects in the area, diminishing water reserves and causing the desert to overtake the original grasslands.

For the field trip, students will continue to deepen their understandings of the diverse peoples at the site by participating in station activities. These activities will highlight the day-to-day lives and various concerns of their characters' identities. The majority of these activities will take place outdoors, utilizing the monument's nature trail, Kahn site, orchard, garden, corral, patio, as well as the fortified ranch house and museum. The activity stations represent Paiute and settler life strategies: plant uses for Paiute hunting/gathering, chore/work activities for the different ways both groups prepared food and other commodities, cattle roping for ranching, packing a wagon for traveling settlers, telegraph operations for communication, and museum search, which reinforces everything they learned. As students go through the activities, they will be asked to think about the concerns of their characters, the positives and negatives of various aspects of their life, and the impact their characters' actions had on the area's natural resources and each other.

At field trip's end, students will develop a personal and more tangible connection to Pipe Spring, giving them the hands-on experiences that bring classroom concepts alive and impact student engagement in natural and cultural history within their local area.

A Kid's Day at Pipe Spring Field Trip Stations

Station A: Telegraph Station (The Telegrapher)

Objectives (Student will be able to):

#1 Understand methods of communicating long distances prior to the telephone
#2 Discuss pre-historical and historical methods of long-distance communication
#3 Infer and discuss economic and social changes in the Utah and the United States with the invention of the telegraph
#4 Be able to translate and produce a message using Morse code

Utah /Arizona State Curriculum:

Utah 3rd Grade Social Studies Standard 2, Objective 1, Indicator f: Explain changes within communities caused by human inventions (e.g. telegraph)
Utah 4th Grade S.S. Stand. 1, Obj. 2, Ind. d: Make inferences about the relationships between the physical geography of Utah and the state's communication and transportation systems (e.g. telegraph)
Utah 4th Grade S.S. Stand. 2, Obj. 3, Ind. e: Identify the factors which bring about economic changes (e.g. new technologies)
Utah 5th Grade S.S. Stand. 4, Obj. 4, Ind. b: Describe the wide-ranging impact of the Industrial Revolution (e.g. inventions, innovations)
Arizona 3rd Grade S.S. Strand 4, Concept 4, PO 2. Describe changes over time in communication networks (e.g., telegraph)
Arizona 5th Grade S.S. Strand 1, Con. 5, PO 4. Describe how manufacturing, textiles, transportation improvements, and other innovations of the Industrial Revolution contributed to U.S. growth and expansion.

Materials:

Telegraph box (with):

- telegraph keys and batteries
- coding worksheet
- laminated Morse code key
- clip boards, one for each pair
- pencils

Procedure:

Opening (3-5 min)

Ask students how they would get a message to their home from Pipe Spring if there were NO electronic devices to use. What would they use now (phone, internet)? Do you know the first machine that made long-distance communication super-fast (telegraph)?

Explain the LDS church role in bringing the telegraph to Pipe Spring:

- In 1862, Brigham Young said, "I want a company raised to stretch a wire through our settlements in this territory, that information may be communicated to all parts with lightning speed."
- Construction started on the line in 1866, Pipe Spring was on-line Dec 1871
- The first telegrapher was Luella Stewart who was only 16
- Prior to the telegraph, it would take one to two weeks to get a message to Salt Lake City; once the line was installed, it

took less than a second (directions, questions, work orders, family news of births, marriages, illnesses would arrive quickly and accurately) to get news all the way from Washington DC!
- Line to Pipe Spring ran from Toquerville to Rockville to Pipe Spring, then to Kanab and Long Valley.

How would this benefit church business, or improve the quality of family or personal lives?

Activity (10-20 min)
Morse code and the Telegraph Key
Conduct a general discussion about codes, "Have you ever sent a secret message?", "How did you know what it said?". Telegraph operators needed a code too. Every operator in the U.S. and the world used the same code (Morse code). How it worked, the operator would tap a message onto a key that sent an electrical message through wire to an operator miles away where another key received the message and the operator decoded it. There were three types of keys in use: one made a clicking noise, a beeping noise, or a bulb would light up (the one we'll use).

Pass out the International Morse code key and explain how to interpret the code. Morse code is a system of dots and dashes (each letter has a combination of dots and/or dashes). A **dot** will only stay on for a quick count to one, and a **dash** will stay on for a quick count to three (demonstrate). Example: the letter "a", you see the light bulb light up for a quick one count then for a longer quick three count, "s" with be three quick counts.

Pass out the Telegraph worksheet. Tell them to do #1, 2 & 3, (Don't do #4 yet).

Display a key and explain that they will work in pairs; each pair will get a key to use. Give guidelines (keys are fragile, use them gently or the key will be removed from the activity, stay seated, share). Point out the parts of the key (battery, key, light).

For the keys, instruct them not to touch them until directed. One student will practice a letter first, then let the other student in the pair try.
Practice:
- gently depress the key to make the light come on
- practice a dot – gently depress the key for a quick one count
- practice a dash – gently depress the key for a quick three count
- now do a dot, followed by a dash
- follow along and do it as I say
    - dash, dash, dot, dash, dot, dot
- chose a letter to type… type it and see if your partner can identify the letter
- repeat the above with the partner

Tell them to go back to their worksheets and start to decode their partner's number #3 for #4. The sender should be patient and repeat each letter as often as their partner needs. The receiving partner should decode the word by writing each letter on the lines for #4.

Closing (2-5 min)
What are some pros and cons with using a telegraph for communication? What technology replaced the telegraph (telephone)? Telephones needed poles and lines until cell phones (satellites and towers). Can they predict a communication system for the future?

Pipe Spring National Monument

Pipe Spring Telegraph Activity
The First Telegraph Station in Arizona, 1871

1. Write the word “cow” using Morse code. _____ _____ _____
c o w

2. Decode this word.

_____ _____ _____

• — — — — — — —•••

3. Write a three letter word in Morse code. Challenge your partner to read the word.

_____ _____ _____

4. Decode your partner’s word.

_____ _____ _____

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_____ _____ _____

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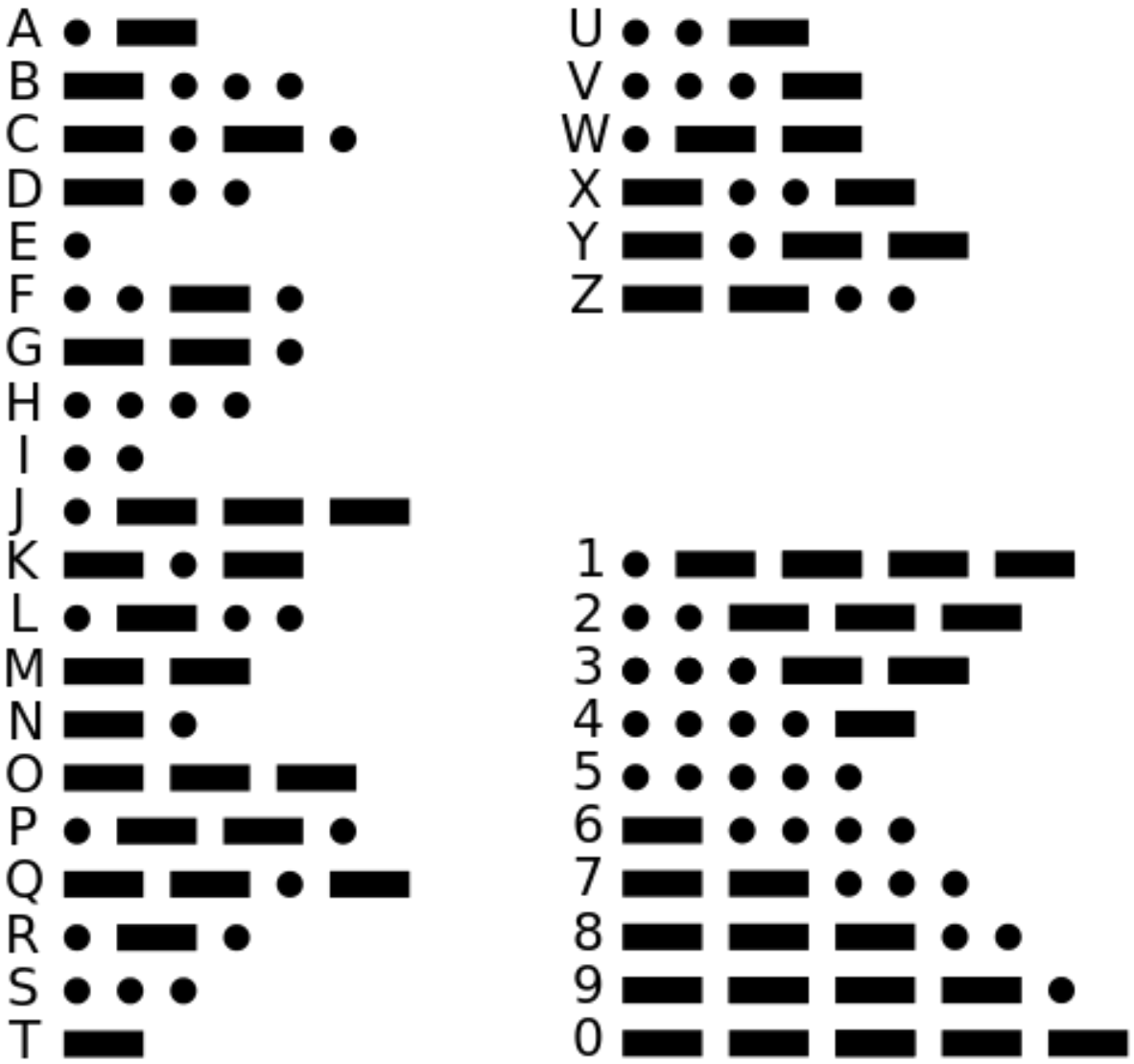
International Morse Code

1. The length of a dot is one unit.
2. A dash is three units.
3. The space between parts of the same letter is one unit.
4. The space between letters is three units.
5. The space between words is seven units.



Station B: Load the Wagon (The Settler)

Objectives (Student will be able to):

#1 Describe various reasons for westward movement by settlers
#2 Discuss the role of wagons in facilitating westward movement
#3 collaborate to determine necessary supplies to stock a wagon

Utah /Arizona State Curriculum:

Utah 3rd Grade Social Studies Standard 2, Objective 1, Indicator f: Explain changes within communities caused by human inventions
Utah 4th Grade S.S. Stand. 1, Obj. 2, Ind. d: Make inferences about the relationships between the physical geography of Utah and the state's communication and transportation systems
Utah 4th Grade S.S. Stand. 2, Obj. 2, Ind. a: Identify key events and trends in Utah history and their significance (e.g. Mormon settlement, westward expansion)
Utah 5th Grade S.S. Stand. 4, Obj. 1, Ind. a: Identify key reasons why people move and the traits necessary for survival
Arizona 3rd Grade S.S. Strand 1, Concept 7, PO 1. Discuss reasons (e.g., famine, political discord, religious persecution, economic opportunity) why people left their home country to start a new life in the U.S.
Arizona 4th Grade S.S. Strand 1, Con. 7, PO 2. Describe the advent of innovations in transportation that helped Arizona's growth and economy
Arizona 4th Grade S.S. Strand 4, Con. 6, PO 1. Describe the impact of geographic features (springs) on migration and the location of human activities (settlement patterns)
Arizona 5th Grade S.S. Strand 1, Con. 5, PO 3. Identify major westward migration routes of the 19th Century
Arizona 5th Grade S.S. Strand 1, Con. 5, PO 4. Describe how manufacturing, textiles, transportation improvements, and other innovations of the Industrial Revolution contributed to U.S. growth and expansion

Materials:

1 sack flour, 100 lbs. each
2 sacks potatoes, 100 lbs. each
1 sack beans, 100 lbs. each
1 sack onions, 100 lbs. each
2 sacks dried fruit, 50 lbs. each
3 sacks coffee, 50 lbs. each
2 sacks salt, 25 lbs. each
2 sacks garlic, 25 lbs. each
1 sack pepper, 10 lbs. each
1 sack sugar, 50 lbs. each
1 sack apples and oranges, 50 lbs. each
1 sack hard candy, 50 lbs. each
1 sack hard boiled eggs, 25 lbs. each
1 sack bread rolls, 50 lbs. each
1 sack potato chips, 25 lbs. each
1 dry erase board and marker

Procedure:

Opening (3-5 min)

When the students arrive at the wagon, hold a Q&A discussion about settlers while giving them a general background about westward expansion. A good way to start is by asking them what they know about Mormon settlement of the Arizona strip.

Pipe Spring National Monument

Throughout the history of the United States after independence, westward movement was a common occurrence during the 19th century. With territorial acquirement from the Louisiana Purchase and later the Mexican War, many in the country saw it as "Manifest Destiny" that the U.S. would span from the east coast to California. Thousands of settlers would head westward to attain land and opportunities that were more limited in the established eastern part of the country. Improvements in transportation via the industrial revolution in the form of railroads and covered wagons increased this westward expansion. In 1861, LDS leader Brigham Young called for several hundred families to settle southern Utah and northern Arizona for the "Dixie Mission" meant to make the Mormon state self-sufficient in warm climate crops like cotton in an effort to escape religious persecution and control of the United States.

Activity (10-20 min)
Focus the conversation to the chuck wagon; it was used for extended periods of time when people were away from food sources for a week or more. Walk around and point out components of the chuck wagon. Regroup the students and explain the activity. It's 1870, they are going out on the AZ Strip for three weeks to search for a good location to set up a new settlement. Stress how limited space is… there will be one wagon for their bedrolls and gear and the chuck wagon will carry all the food their group will need for the three-week trip. If they don't pack enough, they will go hungry!

The wagon has weight limits so you can only load 700 pounds of food (normally it would be double this amount). The challenge…. decide what to take and how much of each type of food.

Show and discuss the burlap sacks:
(Contents, weight and use)

- sugar for pies, cobblers, deserts
- coffee, a warm drink to stay awake
- potatoes, a good starch
- baking powder for biscuits, pancakes
- onions for stews or boiled and eaten
- garlic for flavor
- pepper & salt for flavoring
- beans, protein
- dried fruits for pies, cobblers
- flour for biscuits, pies, pancakes, etc…
- fresh apples & oranges, healthy
- hard candy
- hard boiled eggs, good protein
- bread rolls, carbohydrates

Have small groups of three to four discuss what they should take. Establish an area for their "to-go" pile of sacks. After their discussion, have a kid from each group, one at a time, will move one sack of food to the to-go pile.

- After all the groups have moved one sack add the weights on the dry-erase board
- Discuss the weight and if under or over 700 pounds, have the kids continue to add to or remove from the pile until you reach around 700 pounds
- Encourage them to debate & discuss the benefits and/or deficits of their choices (You might let them vote to remove or add something)

Ok! Time to load the wagon! Have students grab a sack and toss it up until the wagon is loaded (assist students to prevent injury and damage to the wagon).

Closing (2-5 min)
Did the group make good choices?
Ask for thumbs-up or thumbs-down vote…
Discuss what they shouldn't have taken: the candy (no nutritional value), oranges & apples (will spoil), hard boiled eggs (will spoil), bread rolls (will spoil). Ask for comments on something they learned from this activity, this should be fun and lively.

Example Master List,
Food for Twenty Cowboys
on a Three Week Round-Up

- Flour – 3 sacks, 300 lbs
- Sugar – 1 sack, 50 lbs
- Potatoes – 3 bags, 300 lbs
- Onions – 2 bags, 100 lbs
- Beans – 3 sacks, 300 lbs
- Dried fruit – 2 sacks, 100 lbs
- Coffee – 3 sacks, 150 lbs
- Salt – 2 sacks, 50 lbs
- Pepper – 2 sacks, 20 lbs
- Baking powder – 1 sack, 25 lbs
- Garlic – 1 sack, 25 lbs

Station C: Corral Roundup (The Ranch Hand)

Objectives (Student will be able to):

#1 Identify the natural resources of the AZ Strip (water)
#2 Conclude that natural resources and geography determined the ranch's location
#3 Recognize the economic benefits of a cattle ranch for the community
#4 Discuss the role of the cowboy
#5 Understand the environmental impacts at Pipe Spring from overgrazing

Utah /Arizona State Curriculum:

Utah 3rd Grade Social Studies Standard 1, Objective 1, Indicator a: Identify the geographic features common to areas where human settlements exist
Utah 3rd Grade S.S. Stand. 1, Obj. 3, Indicators:
a. Identify ways people use the physical environment (*e.g*. agriculture)
b. Compare changes in the availability and use of natural resources over time
c. Describe ways to conserve and protect natural resources
d. Compare perspectives of various communities toward the natural environment
e. Make inferences about the positive and negative impacts of human-caused change to the physical environment
Utah 3rd Grade S.S. Stand. 2, Obj. 1, Ind. d: Identify and explain the interrelationship of the environment (*e.g.* location, natural resources) and community development (*e.g*. food, industries, and markets)
Utah 4th Grade S.S. Stand. 1, Obj. 2, Ind. c: Compare the development of industry and business in Utah as it relates to its physical geography (*e.g*. cattle ranching)
Utah 4th Grade S.S. Stand. 1, Obj. 3, Ind.:
a. Describe how and why humans have changed the physical environment of Utah to meet their needs (*e.g.* irrigation)
b. Explain viewpoints regarding environmental issues (*e.g.* water rights).
Utah 4th Grade S.S. Stand. 2, Obj. 3, Ind.:
c. Identify examples of producers and consumers in the local community
e. Identify the factors which bring about economic changes *(e.g*. new market development, globalization)
f. Examine how economic development affects communities (*e.g*. overgrazing)
Utah 5th Grade S.S. Stand. 4, Obj. 4, Ind. a: Assess how the free-market system in the United States serves as an engine of change and innovation. (Cattle ranch, railroad)
Arizona 3rd Grade S.S. Strand 4, Concept 2, PO 2. Describe how physical and human characteristics of places change from past to present
Arizona 3rd Grade S.S. Strand 5, Con. 1, PO 6. Discuss how producers use natural, human, and capital resources to create goods and services
Arizona 4th Grade S.S. Strand 1, Con. 7, PO 1. Describe the economic development of Arizona: ranching
Arizona 4th Grade Science Strand 3, Con. 1, Describe how natural events and human activities impact environments
Arizona 4th Grade S.S. Strand 4, Con. 4, PO 1. Describe the factors that have contributed to the settlement, economic development (e.g., ranching) and growth of major Arizona cities
Arizona 4th Grade S.S. Strand 4, Con. 4, PO 5. Describe the major economic activities

and land use patterns (e.g., agricultural, industrial)
Arizona 4th Grade S.S. Strand 4, Con. 5, PO 3. Describe the impact of human modifications (e.g., irrigation, agricultural) on the physical environment and ecosystems
Arizona 4th Grade S.S. Strand 4, Con. 6, PO 1. Describe the impact of geographic features (e.g., springs) on migration and the location of human activities
Arizona 5th Grade S.S. Strand 4, Con. 4, PO 2. Explain the effects (e.g., economic, cultural, environmental) of human migration on places

Materials:

- 3 PVC pipe cattle
- 4 lariats

Procedure:

Opening (3-5 min)

Kids will gather around the corral for lively discussion on the importance of geography, natural resources and the roles of a cowboy on the Pipe Spring cattle ranch.

Key Points:

- LDS church owned this ranch initially
- WHY was the ranch built here instead of somewhere else? (water & grass)
- This used to be grasslands and overgrazing caused changes
- Cattle were sold to raise money, some sold to other ranches, some herded to railhead in Lund, UT (to be shipped East) some were used by the LDS church to feed church members
- As demand for beef increased the number of cattle increased, - up to 50,000 cows on the Strip

Students will be assigned the job of cowboys who are going out on the range for a round up. A good way to start is by asking them what they know about cowboys. Cowboys had many duties on the ranch, such as rounding up and leading livestock, branding cattle, milking cows, and helping with construction projects. The corral and longhorn cattle at Pipe Spring will help students visualize how the ranch appeared in the 1870s.

Activity (10-20 min)

Have students now gather around the PVC pipe cattle. Explain that with the need to round up cattle, cowboys used a very valuable tool, the lariat! The lariat was used to lasso cattle that strayed from the rest of the herd by roping their limbs or head to direct them to where they needed to be. Demonstrate the proper use of a lariat on the PVC pipe cattle.

- Step #1: Place your throwing hand in the loop of the lariat, making the loop at least as long as the distance from your waist to your knees. Your other hand will loosely hold the end of the rope. Your feet should be at least shoulder width apart. (In the palm of your hand, the noose loop should point into the loop and not away from it)
- Step #2: Stand about 3 to 6 feet away from the calf. You should be facing the hind end of the animal. Raising up your throwing hand above your head and twisting your wrist (clockwise or counterclockwise), spin the rope in big loops. Your weight should be resting back on your dominant foot. Remember, you don't necessarily have

to spin the rope as fast as you can as long as you have good momentum!!!

- Step #3: Release the rope towards the calf when your arm swings forward. At the same time you should step forward with your dominant foot towards the calf.

After demonstrating how to rope the cattle, split the group in three. Have each group line up behind one the cattle at least 6 feet away. Allow each kid three tries to rope the cow.

Closing (2-5 min)

Ask students what are the conditions that allowed a ranch to be established at Pipe Spring. Ask if a ranch would work here now, why or why not (not enough grass and water due to overgrazing)? Was a cowboy's job physically demanding? Allow students to keep roping if time permits until it is time to move to the next station.

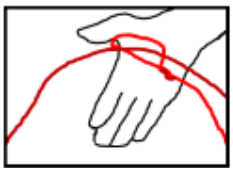
ROPING STATION: STEP #1

Welcome to the roping station, help Cowboy Rick lasso up some runaway cattle using a lariat!

Place your throwing hand in the loop of the lariat, making the loop at least as long as the distance from your waist to your knees.

Your other hand will loosely hold the end of the rope.

Your feet should be at least shoulder width apart.



(In the palm of your hand, the noose loop should point into the loop and not away from it)

ROPING STATION: STEP #2

Stand about 3 to 6 feet away from the calf. You should be facing the hind end of the animal.

Raising up your throwing hand above your head and twisting your wrist (clockwise or counterclockwise), spin the rope in big loops.

Your weight should be resting back on your dominant foot.

Remember, you don't necessarily have to spin the rope as fast as you can as long as you have good momentum!!!

ROPING STATION: STEP #3

Release the rope towards the calf when your arm swings forward.

At the same time you should step forward with your dominant foot towards the calf.

Try it three times, then give someone else a chance!

Station D: Paiute Way of Life (The Paiute Gatherer)

Objectives (Student will be able to):

#1 Identify natural resources traditionally utilized by the Kaibab Paiute at Pipe Spring
#2 List different uses of the yucca plant
#3 Understand importance of Indian ricegrass to Paiute diet at Pipe Spring
#4 Describe one way the Paiute taught life lessons to children
#5 Understand the impacts from 1870s cattle ranches on Kaibab Paiute way of life

Utah /Arizona State Curriculum:

Utah 3rd Grade Social Studies Standard 1, Objective 2, Indicator c: Describe how communities have modified the environment to accommodate their needs
Utah 3rd Grade S.S. Stand. 1, Obj. 2, Ind. d: Investigate ways different communities have adapted into an ecosystem (migration)
Utah 3rd Grade S.S. Stand. 1, Obj. 2, Ind. d:
a. Identify ways people use the physical environment
b. Compare changes in the availability and use of natural resources over time
c. Describe ways to conserve and protect natural resources
d. Compare perspectives of various communities toward the natural environment
e. Make inferences about the positive and negative impacts of human-caused change to the physical environment
Utah 3rd Grade S.S. Stand. 2, Obj. 1, Ind. e: Examine changes in communities that can or have occurred when two or more cultures interact
Utah 4th Grade S.S. Stand. 1, Obj. 3, Ind. a: Describe how and why humans have changed the physical environment of Utah to meet their needs
Utah 4th Grade S.S. Stand. 1, Obj. 3, Ind. b: Explain viewpoints regarding environmental issues
Utah 4th Grade S.S. Stand. 2, Obj. 2, Ind. a: Identify key events and trends in Utah history and their significance (e.g. American Indian settlement, European exploration, Mormon settlement, westward expansion)
Utah 4th Grade S.S. Stand. 2, Obj. 3, Ind. f: Examine how economic development affects communities (e.g. overgrazing)
Utah 5th Grade S.S. Stand. 4, Obj. 1, Ind. d: Assess the impact of expansion on native inhabitants of the west
Arizona 3rd Grade S.S. Strand 5, Con. 1, PO 1. Identify how scarcity requires people to make choices due to their unlimited wants and needs
Arizona 3rd Grade S.S. Strand 5, Con. 1, PO 6. Discuss how producers use natural, human, and capital resources to create goods and services
Arizona 4th Grade S.S. Strand 1, Con. 5, PO 5. Describe the conflict of cultures that occurred between newcomers and Arizona Native Americans
Arizona 4th Grade S.S. Strand 3, Con. 1, PO 4. Describe the varied backgrounds of people living in Arizona: shared principles, goals, customs and traditions
Arizona 4th Grade Science Strand 3 Con. 1. Describe how natural events and human activities impact environments
Arizona 4th Grade Science Strand 6 Con. 2. Understand processes acting on the earth (erosion) and evidence of their occurrence

Arizona 4th Grade S.S. Strand 4, Con. 4, PO 4. Describe the cultural characteristics (e.g., food, clothing, housing, sports, customs, beliefs) of Arizona's diverse population
Arizona 4th Grade S.S. Strand 4, Con. 4, PO 5. Describe the major economic activities and land use patterns (e.g., agricultural, industrial, residential, harvesting of natural)
Arizona 4th Grade S.S. Strand 4, Con. 5, PO 3. Describe the impact of human modifications (e.g., irrigation, agricultural) on the physical environment and ecosystem
Arizona 5th Grade S.S. Strand 4, Con. 4, PO 2. Explain the effects (e.g., economic, cultural, environmental, political) of human migration on places

Materials:

- yucca activity box (examples of rope, nets, needle & thread, three yucca leaves for demo, two to pass around)
- two colors of twine per student, cut to about 12"
- 4 Moouts' & Mawd' (grinding stones)
- Sack of Indian Rice Grass seed
- 4 sets of Too'Dook Weep game (mats, stick dice, tokens)

Procedure:

Opening (3-5 min)

This station covers Kaibab Paiute adaption to their environment through multiple uses of natural resources found at Pipe Spring. This in turn shaped their culture and lifeway, which helped to sustain the water and grasslands essential to their continued existence. Cover the following points:

- Why did the Kaibab people live HERE for hundreds of years? (water, Indian ricegrass)
- What did they need to survive here? (The spring for water and food from plants and animals that lived here)
  * sheep and cows were not here until the 1860s
- What happened to the plants and wild animals here when thousands of cows and sheep were brought by Mormon settlers (livestock ate all the ricegrass that the Paiute ate, and polluted the water with their waste)?

Activity (10-20 min)

Note: If station is 30 minutes, include yucca activity; if station is 15 minutes, have students only grind ricegrass and/or play Too'DookWeep

Yucca Rope Activity:

In order to survive the Paiute developed multiple uses of plants that grew naturally to meet all their needs. Once such plant was the yucca! Identify the leaves, stalk, flowers & fruit, and then begin a discussion on the yucca:

- Can you eat a yucca plant? What part of it would you eat? Why?
- What parts of this plant do you think you could you use to make tools?

This one plant can be used to make many thing we use today:

- White flowers (petals eaten raw, boiled, mashed and put into bread)
- Fruit (eaten raw, baked or boiled)
- Stalk (cut off the top 2 -3' and eat raw like a giant asparagus; hollow out the spike to make a quiver carry arrows)
- Root (pound it into mush, mix with water to make a soap)

- Leaves (cut and mashed ends to make paint brushes; sap used as salve for wounds; strands of fiber attached to the tip used as a needle and thread; dried tip was dried into an awl to punch hole in animal hide)

Yuccas can be used as food, tools, medicine, soap, and paintbrushes; but there is even more that this plant gives us. Yucca can be used to make rope to make other items! Demonstrate the stages of obtaining fiber strands with three yucca leaves:

- First the whole unworked leaf
- Then the semi pounded and soaked leaf
- Finally the leaf with fibers that can be pulled off – pass two around

From these fiber strands the Paiute made rope. With that rope they made fishing line/nets, rabbit nets (long nets that would be set in grass and rabbits would be driven into), bow strings, sandals, baskets to carry water (coated in pine sap to keep them watertight) and to cook. Pass around items made of yucca rope.

Now students will get to make their own two-strand rope out of yucca:

- Have students in a semi-circle
- Each student gets two strands of twine, one each of a different color
- Demonstrate twisting the two strands together to form a rope then have the students try it on their own
- Help students tie off their ropes so they can keep it as a souvenir

Indian Ricegrass Grinding:
Ask students if they ate grass today (If they ate bread, cereal, cookies, rice crispy treats, or even Doritos, then they have!). Grasses cover about 40% of the land surface on earth, and some of the most common grasses we eat today are corn, rice, and wheat. The Kaibab Paiute relied on the Indian rice grass that grew here, taking the seeds and grinding them into flour to make breads and other foods. Demonstrate how to use the Moouts' & Mawd' to grind the seeds into flour. Have students line up behind the grinding stones and take turns grinding ricegrass seeds into flour.

Ask students why there isn't much ricegrass at Pipe Spring today (It was overgrazed by the livestock brought by the Mormon settlers). Due to overgrazing, the grass couldn't grow back in time, and with no grasses in place the thin top soil blew away, letting mostly the desert plants you see here now to grow. Because of that, the Kaibab Paiute lost a major dietary staple and many starved.

Too'DookWeep Game:
Ask students if they like playing games, and what type of games they like to play. Reveal that they will now get to play a Southern Paiute game. Inform students that the Paiute played games for fun, but they also used them to teach life lessons to children and teach them about their beliefs and culture. Another way the Paiute taught their children was through stories. Around one of the game boards, explain the rules of Too'DookWeep and show students how to use the stick dice. Have students play in groups of four or five per game mat.

Closing (2-5 min)

Today we purchase many of the things we need in stores, but traditionally people like the Paiute had to make everything themselves. Ask students if they lived back then, do they think they could make many of the things they would need in their day-to-day lives from the plants and animals around them? A core mission of the National Park Service at Pipe Spring is to teach conservation our natural resources so they will be around for many generations to come. Now that they know how useful plants around them like the yucca are, they can spread the word about not disturbing plants, resources and wildlife in our nation's parks and monuments!

How to Play Too'DookWeep

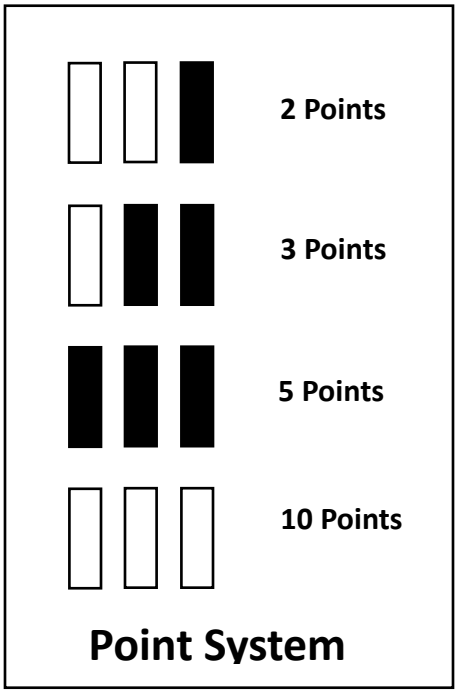
1. Choose a game token to move around the game board.

2. Decide the order in which players will take turns.

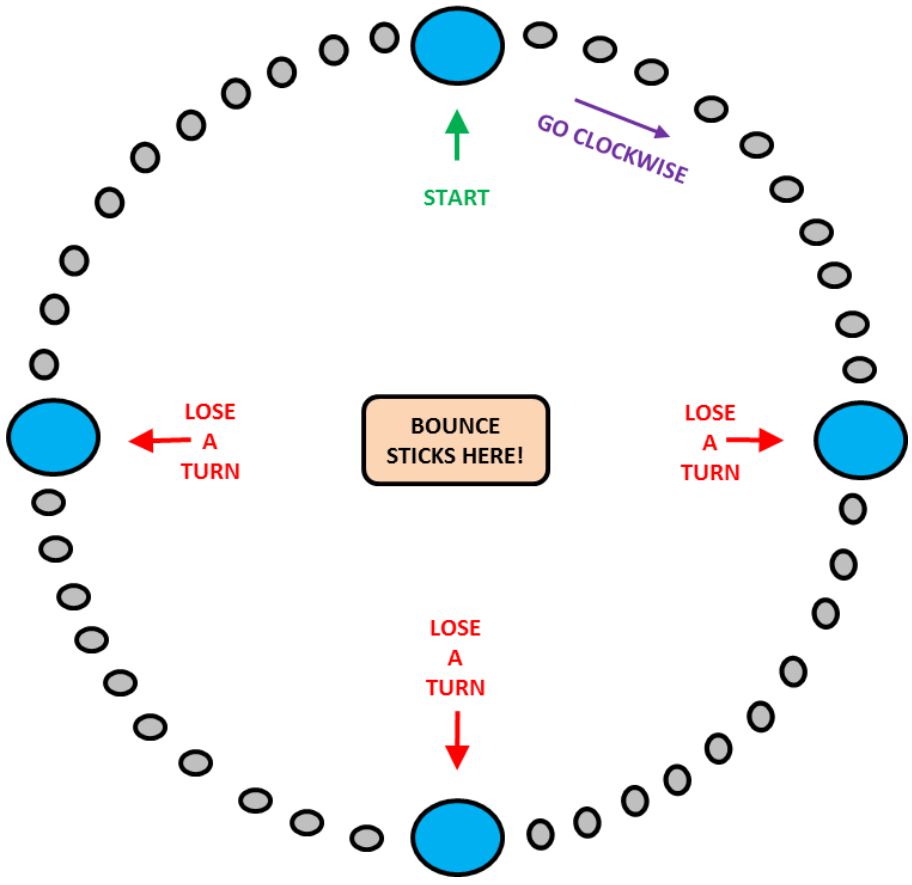
3. With the sticks in your hand, bounce them off the flat stone in the center of the circle.

4. Move your token the number of spaces based on the points from how the sticks land (double points for a quicker game).

5. If you land on one of the large blue circles (water), you lose a turn.



FIRST ONE ALL THE WAY AROUND WINS!



Station E: Making Butter (The Dairy Maid)

Objectives (Student will be able to):

#1 Identify the purpose of Winsor Castle (protect Mormon settlers and spring)
#2 Understand the importance of dairy operations at Pipe Spring for the larger Mormon economy in the Arizona Strip
#3 Learn uses for common items used at Pipe Spring in the 1870s

Utah /Arizona State Curriculum:

Utah 3rd Grade S.S. Stand. 2, Obj. 1, Ind. d: Identify and explain the interrelationship of the environment (e.g. location, natural resources, and climate) and community development (e.g. food, shelter, clothing, industries, and markets)
Utah 4th Grade S.S. Stand. 1, Obj. 2, Ind. c: Compare the development of industry and business in Utah as it relates to its physical geography (e.g. cattle ranching)
Utah 4th Grade S.S. Stand. 1, Obj. 3, Ind. a: Describe how and why humans have changed the physical environment of Utah to meet their needs (e.g. irrigation)
Utah 4th Grade S.S. Stand. 1, Obj. 3, Ind. b: Explain viewpoints regarding environmental issues (e.g. water rights)
Utah 4th Grade S.S. Stand. 2, Obj. 3, Ind:
b. Describe the role of producers and consumers
c. Identify examples of producers and consumers in the local community
e. Identify the factors which bring about economic changes *(e.g*. natural resource development, new market development)
Arizona 3rd Grade S.S. Strand 4, Con. 1, PO 6. Recognize characteristics of human and physical features: a. physical (i.e. spring)
Arizona 3rd Grade S.S. Strand 5, Con. 1, PO 6. Discuss how producers use natural, human, and capital resources to create goods and services
Arizona 4th Grade S.S. Strand 1, Con. 7, PO 1. Describe the economic development of Arizona: ranching, farming, and dams
Arizona 4th Grade S.S. Strand 4, Con. 1, PO 5. Describe characteristics of human and physical features: a. physical – (i.e. spring)
Arizona 4th Grade S.S. Strand 4, Con. 4, PO 5. Describe the major economic activities and land use patterns (e.g., agricultural, industrial, residential, harvesting of natural)
Arizona 4th Grade S.S. Strand 4, Con. 6, PO 1. Describe the impact of geographic features (e.g., springs) on migration and the location of human activities (e.g., settlement)

Materials:

- 1 Butter churn
- 10 small mason jars (or baby food jars)
- 10 marbles
- 3 cartons of cream

Procedure:

Opening (3-5 min)

Gather the kids outside the fort near the pond area. Ask them where they think the water is coming from. Point out it is coming from the fort. Then ask why people would build a fort over the water. Explain that water was very valuable in the arid Arizona strip and when the Mormons settled at Pipe Spring they soon encountered Navajo that were raiding ranches and farms to survive after being forced from their homes.

Point out that a Mormon ranch like Pipe Spring was more like a church run community than just a business for raising livestock. Ask kids what things make up a community (homes, stores, churches, industry, schools). Pipe Spring was used to collect livestock from other places like Fillmore UT, as well as raise their own to provide dairy products like butter and cheese to workers building the Mormon Temple in St. George. An important duty at Pipe Spring was milking the cows (everybody helped). Let the kids know they now will get to see how people made dairy products at Pipe Spring.

Activity (10-20 min)

If time permits, inform students that you will take them through the spring room and cheese room of the fort. Lay down the ground rules (no touching anything unless told to do so, it's a museum! Also, stay with the group and don't enter another room until instructed to do so). *Again if time permits*, before entering the first room, allow students to touch items on the touch table in the courtyard, ask them what they think certain items are. Do they use any of the items now? If not, do they use something similar? When going through the rooms, quiz the students on what each room was used for.

Spring Room Note: The flow of water is also greatly reduced from its flow rate in the 1870s, can the students guess why? (Overuse)

Now students will actually help make butter! Once exiting the cheese room and the fort, explain how cream is poured into the churn and the operator uses the plunger by moving it up and down to turn the cream into butter. The excess liquid leftover is buttermilk! In pairs of two, pass out the jars filled with cream and a marble placed inside the jar (the marble will help churn the cream into butter faster). Have the students shake the jars or roll them to their partners. The cream might not turn into butter in the time allotted for the station, but the student should notice a change in the thickness and appearance of the cream in the jar. Let students know at one time around 40 lbs. of butter and 60 lbs. of cheese were made daily at Pipe Spring, mostly by women!

Closing (2-5 min)

Ask the students why was Pipe Spring important to the Mormons (It fed the population in St George). What kind of things were produced here (Beef, butter, cheese, milk)?

Alternate Station: The Atlatl (Ancestral Puebloans)

Objectives (Student will be able to):

#1 Compare and interpret results of why an atlatl is preferable to only a spear (distance a spear can be thrown by hand, and with the addition of a lever)
#2 Identify levers (thrower) and wedges (arrow point) as simple machines
#3 Recognize that technological inventions improved effectiveness
#4 Understand the challenges of hunting and survival for the native people around Pipe Spring
#5 Safely use an atlatl

Utah /Arizona State Curriculum:

Utah 3rd Grade Social Studies Standard 2, Objective 2: Explain how selected indigenous cultures of the Americas have changed over time
Utah 4th Grade S.S. Stand. 2, Obj. 1, Indicator e: Explain the importance of preserving cultural prehistory and history, including archaeological sites and other historic sites and artifacts
Utah 3rd Grade Science Stand. 3: Students will understand the relationship between the force applied to an object and resulting motion of the object
Utah 3rd Grade Science Stand. 4: Students will understand that objects near Earth are pulled toward Earth by gravity
Arizona 3rd Grade S.S. Strand 1, Concept 1, PO 2. Recognize how archaeological research adds to our understanding of the past
Arizona 4th Grade S.S. Strand 1, Con. 1, PO 4. Describe how archaeological research adds to our understanding of the past
Arizona 4th Grade S.S. Strand 1, Con. 2, PO 1. Describe the legacy and cultures of prehistoric people in the Americas
Arizona 5th Grade S.S. Strand 1, Con. 1, PO 5. Describe how archaeological research adds to our understanding of the past
Arizona 5th Grade S.S. Strand 1, Con. 3, PO 1. Recognize that Native American tribes resided throughout North America before the period of European exploration and colonization

Materials:

- atlatls – 4 throwers and at least 10 darts
- tape measure (optional)
- distance markers (optional)
- targets (optional)
- clipboard (optional)
- graphing handout (optional)
- 2 ropes and 4 cones to designate the do-not-cross line for non-throwing students and throw line

Safety

- All students MUST listen to commands of the ranger (chaperones should help)
- All students will be behind the rope, unless on the throwing line or told to retrieve darts.
- No one is allowed to retrieve darts until the “all clear” is given.
- All projectiles will be put into container before anyone enters the field to retrieve darts.
- No running.
- Do not step on darts!
- The activity is ONLY for students who follow directions – any transgression will get him/her removed.

Procedure:

Opening (3-5 min)

Ask students how long people have lived near Pipe Spring (more than a thousand years!). Some of those first people are referred to as prehistoric or archaic people because there is no written records from them. How do we know they were here? Archeologists and regular people have found items they used so many years ago.

Ask students "How did Ancestral Puebloans here get their food?" Although a lot of the food they ate was gathered or farmed, they also hunted for meat. Explain difficulties involved in hunting (animals have good hearing, some can be dangerous, it's difficult to get close before the animal runs away, etc.). How could people overcome these problems (weapons/tools)? Ask students what weapons they think people used a long time ago (spears, bows and arrows). Before bows and arrows, atlatls were the most common hunting weapon. Weapons like atlatls gave people additional power and range using levers. Atlatls are a type of lever, with a lever being a simple machine that consists of a rigid object (bar), and a pivot (fulcrum). Applying force to one end of the rigid object causes it to "pivot" about the fulcrum, causing a magnification of the force at the other end. Atlatls are third class levers, with other examples being brooms, tennis rackets, and our own arms. Because the atlatl essentially doubles the length of the thrower's arm, it can easily deliver much more power and range as a dart thrown like a traditional spear.

Activity (10-20 min)

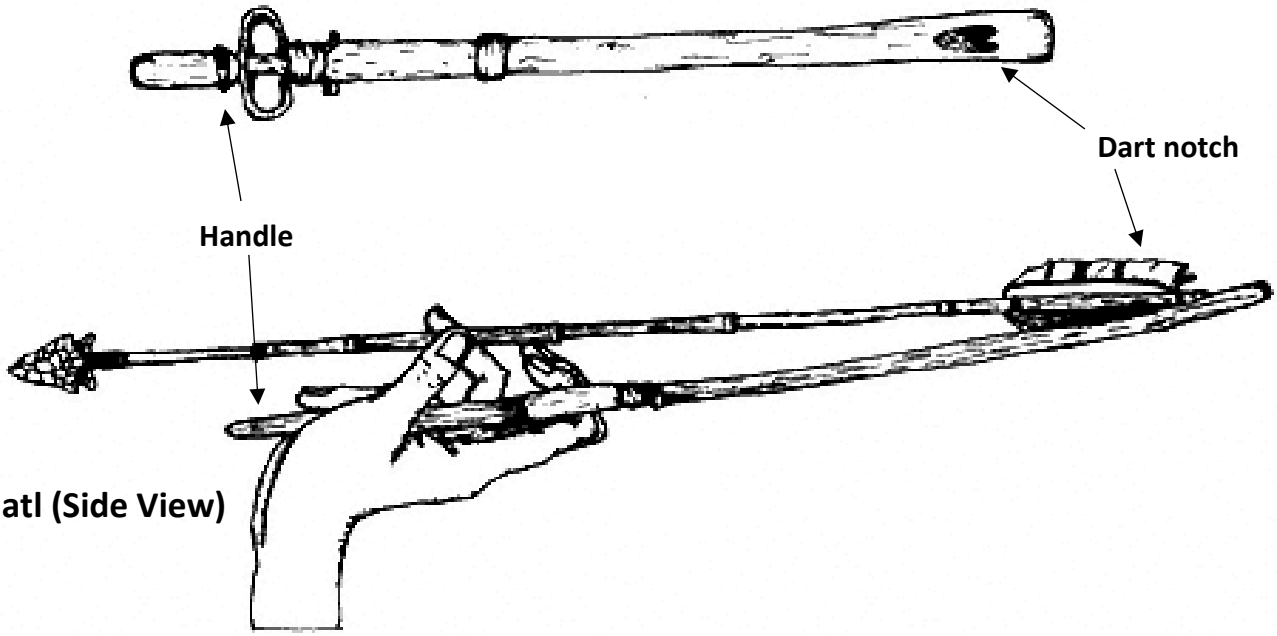
Have students line up behind the non-throwing line. **Safety talk**!!! Demonstrate throwing the atlatl dart using your arm only. Next, demonstrate how to load, and safely shoot the dart using the atlatl thrower (it's similar to casting a fishing rod). Students should see a difference in force and distance. Allow one to two students to step forward to the throwing line. Have them first throw using only their arms after giving the command to do so (one to five throws depending on time and number of students). On command allow the students who threw to collect the darts. If using the graphing handout allow them to fill out their sheets.

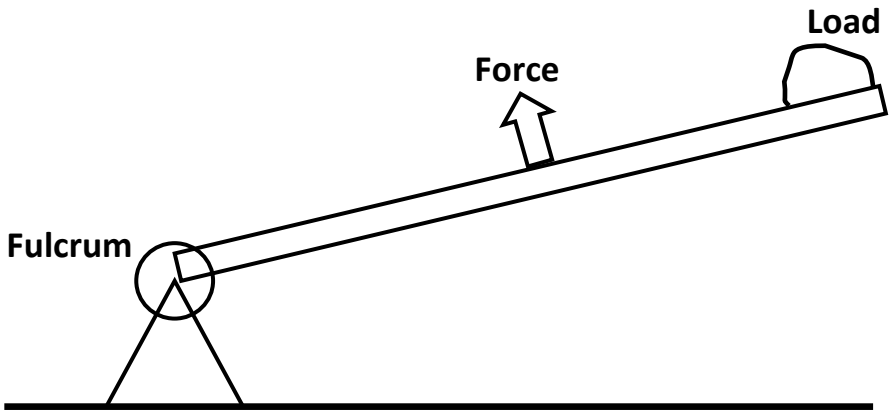
Next allow them to throw using the atlatl thrower giving them commands when to do so (again one to five throws depending on time and number of students). On command allow the students who threw to collect the darts. If using the graphing handout allow them to fill out their sheets. Discuss how the dart went further when they used the atlatl. Force and distance increase using the thrower.

Closing (2-5 min)

Discuss the results, pros and cons of an atlatl to hand throwing a spear (greater range vs more skill to master). With an atlatl, people could throw farther and with more force to increase chances of a successful hunt. If you weren't successful your family would go hungry. We know about the tools ancient people used due to evidence found by archaeologists. Archaeologists helps us understand about ancient people using evidence left behind. Explain the importance of leaving artifacts where we find them, so archaeologists can study them.

Atlatl (Top View)





Class Three Lever

Atlatl Graphing Handout

Arm only trials	Atlatl trials
1._____	1._____
2._____	2._____
3._____	3._____
4._____	4._____
5._____	5._____
total_____	total_____
average_____	average_____

average = total divided by number of trials

1. Briefly explain why the atlatl thrower increases distance._____

_____

_____

2. Name two simple machines you used today.

_____ _____

3. About how many years ago were ancestral Puebloans using atlatls to hunt in the area?

_____

4. Name two levers you commonly use.

_____

_____